



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
05.12.2001 Bulletin 2001/49

(51) Int Cl.7: **H04B 1/707, H04L 7/033**

(43) Date of publication A2:
07.05.1997 Bulletin 1997/19

(21) Application number: 96117432.3

(22) Date of filing: 30.10.1996

(84) Designated Contracting States:
DE FR GB

(30) Priority: 02.11.1995 JP 31002195

(71) Applicants:
• **Yozan Inc.**
Tokyo 155-0031 (JP)
• **NTT MOBILE COMMUNICATIONS NETWORK INC.**
Minato-ku, Tokyo 105-8436 (JP)

(72) Inventors:
• **Shou, Guoliang c/o Yozan Inc.**
Setagaya-ku, Tokyo 155, (JP)

• **Zhou, Changming c/o Yozan Inc.**
Setagaya-ku, Tokyo 155, (JP)
• **Yamamoto, Makoto c/o Yozan Inc.**
Setagaya-ku, Tokyo 155 (JP)
• **Takatori, Sunao c/o Yozan Inc.**
Setagaya-ku, Tokyo 155 (JP)
• **Sawahashi, Mamoru 1-59-17 Tomlokanishi,**
Yokohama-shi, Kanagawa 236, (JP)
• **Adachi, Fumiyuki**
Yokohama-shi, Kanagawa 236 (JP)

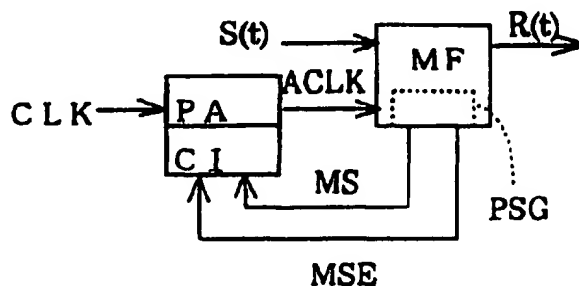
(74) Representative: **Grünecker, Kinkeldey,**
Stockmair & Schwanhäusser Anwaltssozietät
Maximilianstrasse 58
80538 München (DE)

(54) **Matched filter circuit**

(57) The present invention has an object to provide a matched filter circuit which is possible to synchronize a spreading code with an input signal. A matched filter according to the present invention samples input signal

in response to three clocks from the first to the third shifted by a half cycle of a sampling signal so as to judge whether the sampling clock is ahead or behind of the input signal according to signs of input signal sampled. One clock is selected to be the sampling clock.

Fig. 1





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 96 11 7432

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Clg)
Y	POVEY G J R ET AL: "SIMPLIFIED MATCHED FILTER RECEIVER DESIGNS FOR SPREAD SPECTRUM COMMUNICATIONS APPLICATIONS" ELECTRONICS AND COMMUNICATION ENGINEERING JOURNAL, INSTITUTION OF ELECTRICAL ENGINEERS, LONDON, GB, vol. 5, no. 2, 1 April 1993 (1993-04-01), pages 59-64, XP000363818 ISSN: 0954-0695 * page 59, left-hand column; figure 5 * * page 62, middle column, paragraph 4 *	1-6	H04B1/707 H04L7/033
Y	US 4 789 996 A (BUTCHER JAMES S) 6 December 1988 (1988-12-06) * column 1, line 14 - line 20 * * column 1, line 41 - line 43 * * column 10, line 8 - line 9 * * column 10, line 13; figure 1 *	1-6	
Y	* figure 4A *	1,5,6	
Y	US 4 535 459 A (HOGGE JR CHARLES R) 13 August 1985 (1985-08-13) * figure 3 * * figure 1 *	1-6	TECHNICAL FIELDS SEARCHED (Int.Clg) H04B H04L G06G G11C
Y	US 5 034 967 A (COX WILLIAM M ET AL) 23 July 1991 (1991-07-23) * column 1, line 15 - line 19; figure 5 * * column 1, line 47 - line 58 *	2,4	
Y	US 4 151 485 A (LAFRATTA LAURENCE A) 24 April 1979 (1979-04-24) * figure 1 *	3	
		-/--	
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 16 October 2001	Examiner Giglietto, M
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1500 (03.02) (P04001)



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 96 11 7432

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	PATENT ABSTRACTS OF JAPAN vol. 018, no. 623 (E-1635), 28 November 1994 (1994-11-28) -& JP 06 237148 A (TAKAYAMA:KK), 23 August 1994 (1994-08-23) * abstract *	7-10	
A	PATENT ABSTRACTS OF JAPAN vol. 018, no. 614 (P-1830), 22 November 1994 (1994-11-22) -& JP 06 231286 A (TAKAYAMA:KK), 19 August 1994 (1994-08-19) * abstract *	7-10	
			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 16 October 2001	Examiner Giglietto, M
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons Δ : member of the same patent family, corresponding document</p>			

EPD FORM 1503 03.02 (Prelim)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 96 11 7432

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

16-10-2001

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 4789996	A	06-12-1988	EP NO	0326007 A2 890378 A	02-08-1989 31-07-1989
US 4535459	A	13-08-1985	NONE		
US 5034967	A	23-07-1991	US AU WO AU WO	5050189 A 4849790 A 9007238 A1 4527589 A 9006022 A1	17-09-1991 10-07-1990 28-06-1990 12-06-1990 31-05-1990
US 4151485	A	24-04-1979	NONE		
JP 06237148	A	23-08-1994	JP	3074632 B2	07-08-2000
JP 06231286	A	19-08-1994	JP US	2985999 B2 5465064 A	06-12-1999 07-11-1995

EPO FORM P0439

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82